Time-mortality rate of Roi Et strain was 382±26.41 minutes, significantly higher than Nonthaburi (150±25.10 minutes) and BKK1 strain (145±20.49 minutes) at $p<0.001$. Temephos resistance ratio (RR_{100}) in *Ae. aegypti* Roi Et strain was 2.64-fold higher at lethal time (LT_{100}) value than the reference *Ae. aegypti* BKK1 strain. Mean optical density (O.D.) value from biochemical microplate assay for non-specific esterase of Roi Et strain was higher than the mean O.D. for non-specific esterase of both Nonthaburi and BKK1 strains. Insensitive acetylcholinesterase was not found to be responsible for the resistance in the field-collected mosquitoes. This study suggests that esterase detoxification is the primary cause of resistance in *Ae. aegypti* population from Roi Et and both bottle bioassay and biochemical microplate assay are proven to be promising tools for initial detection and field surveillance for temephos resistance.

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USE OF REMOTE SENSING AND GIS TO IDENTIFY AND CHARACTERIZE MALARIA VECTORS BREEDING HABITATS IN THAILAND AND REPUBLIC OF KOREA

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Two entomological studies were made in malaria-endemic of Ganghwa Island and Paju District, Republic of Korea (ROK) during July to September 2003, and around three villages of Ban Khun Huay, Ban Pa Dae, and Ban Tham Seau, Measod District, Tak Province, Thailand, during September 2000 to October 2003. We aimed to use remote sensing (RS) and Geographic Information System (GIS) to 1) examine the temporal and geographic distribution of malaria vector *Anopheles* mosquitoes, 2) determine whether there is a link between adult mosquito distribution and location of larval habitats, and 3) identify larval habitats that produce key vector species in order to target the control efforts. We mapped out breeding habitats and patients addresses of all study areas using Global Positioning System (GPS). Adult and larval mosquito sampling were conducted throughout the study areas, and mosquito distribution and abundance mapped. The GIS databases were used to quantify spatial and temporal relationships between larval habitats and characterization of adult mosquito density in the associated study areas. High spatial resolution satellite data (LANDSAT, IKONOS, and QuickBird) were used to provide up-to-date baseline mapping of recent or temporary development activities. LANDSAT satellite image of ROK (with spatial resolution of 30 meters), and IKONOS satellite image of Thailand (with spatial resolution of 1 meter) were classified for land-use/land-cover. Stream network was delineated and displayed. Proximity analysis was performed on the locations of houses with and without malaria cases within mosquito flight ranges from breeding habitats of *An. minimus* stream margins in Thailand and *An. sinensis* (sensu Lee, 1998) rice paddy in ROK. Statistical test was performed to evaluate whether houses with malaria cases have higher proximities to breeding habitats than houses without malaria cases. The relationship between larval and adult mosquito distribution and observed malaria distribution will be analyzed and discussed.

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